Safe Packaging

The total amount of LLRW generated from decommissioning will be relatively small – roughly 1 - 2 truckloads per week during a peak two-year period, beginning in early 2003.

Safe Packaging for Transportation and Disposal

Waste generated from decommissioning the Reactor Facility is dry, solid, low-level radioactive waste (LLRW) - much of it consisting of concrete rubble, metal debris and dirt containing very, very low levels of radioactivity. It is not spent nuclear fuel or high-level radioactive waste. LLRW is classified for purposes of both transportation and disposal and is strictly regulated.

U.S. Nuclear Regulatory Commission (NRC)

The NRC has three classifications for disposal of solid LLRW. This classification is based on the longest-lived isotopes present and how easily they can migrate.

CLASSIFICATIONS FOR DISPOSAL

- **CLASS A** extremely low levels of LLRW
- **CLASS B** higher levels of LLRW
- **CLASS C** highest levels of LLRW allowed in a LLRW disposal facility

Most of the waste from decommissioning has very low levels of radioactivity and will be shipped under the LSA classification in "strong, tight containers" such as steel drums, "SeaLand" containers (metal structures premounted on trucks) and B-25 boxes.

U.S. Department of Transportation (DOT)

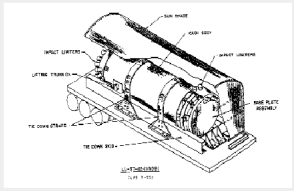
The DOT has three classifications for shipping solid LLRW. The classification is based on the amount of radioactivity in a container. To be protective of human health and the environment, the type of shipping container used depends on the type and amount of specific isotopes present in the waste.

CLASSIFICATIONS FOR SHIPPING

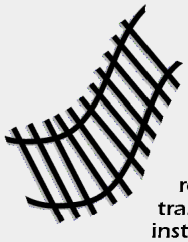
- **Low Specific Activity (LSA)**
- **Type A**
- **Type B**

TYPE A
packages are designed to retain their contents under normal conditions of transport such as vibration, heavy rain and pressure from stacking.

TYPE B
packages are designed to protect and retain their contents under both normal and severe accident conditions and are certified by the NRC before use and are re-certified every 5 years.



Example of Type B cask



Cask/Liner Transfer System

Waste from segmentation of the reactor internals and vessel will be placed in cylindrical steel liners (roughly 5 feet in diameter and six feet tall) to meet disposal regulations, and then placed in Type B containers called casks to comply with transportation regulations. A cask/liner transfer system (similar to a trolley track) is being installed to move the very heavy casks and liners into and out of the containment vessel.

1. A liner wrapped in plastic to protect from contamination, will be lifted by crane and rolled into the containment vessel via the cask/liner transfer system.
2. The liner will be lowered by crane into a reactor quadrant where it will be filled, sealed and stored there.
3. When a cask arrives at the Reactor Facility, it will be rolled into the containment vessel via the cask/liner transfer system.
4. The liner will be lifted by crane, the plastic will be removed and the liner will be placed into the cask.
5. The cask will be sealed, surveyed and rolled out of the containment vessel and lifted by crane onto a "low boy" truck for shipping.
6. Everything will be surveyed again before the truck leaves the site.

Safe Shipping & Disposal

Rigorous Shipping Procedures

NASA is following a strict shipping protocol to ensure the safe transport of all LLRW.

NASA will notify local authorities - including the Erie County Emergency Management Authority and local police - in advance of a planned shipment, and will coordinate the optimal time of day, and day of week for the truck's departure to minimize impact to local traffic.

For security purposes, NASA will not provide exact shipment dates to the public but will provide general schedule information and note when the shipments have been completed. NASA will include these updates on the 24-hour, toll-free Information Line (1-800-260-3838).

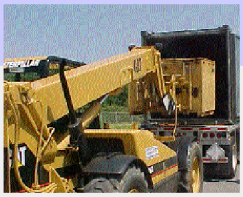
Packages are inventoried, surveyed, inspected, sealed, and properly labeled

Packages ready for shipping are kept onsite in secure storage area until transport vehicle arrives.

When transport vehicle arrives at Plum Brook Station, the truck and driver are surveyed to ensure that contamination is not being carried onto the site.

Trucks may be used to transport the waste to its designated waste facility, or they may travel as far as a railroad spur where the shipment will be transferred to rail to reach its final disposal destination.

B-25 boxes are loaded onto flatbed truck, or liner is placed inside a cask that is secured to a specialized "low boy" truck. The liner will be disposed of, but not the cask.



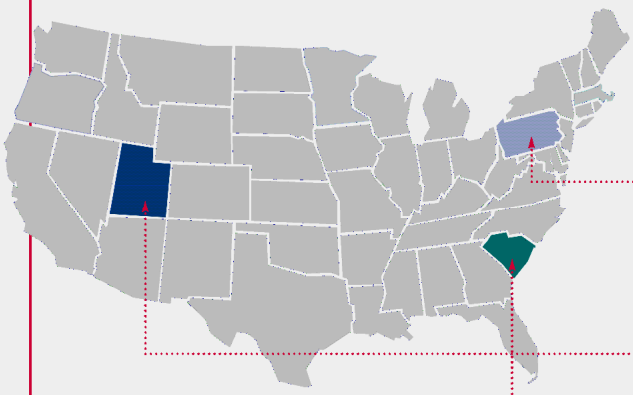
Casks are closed and leak tested. Final shipping surveys are performed on driver and exterior of truck.

Final paperwork is reviewed and certified. NASA and the shipper sign the shipping manifest.

NASA is employing only licensed and highly regarded transportation companies for shipping during the project.

Truck travels on Plum Brook Station property as long as possible to minimize traffic through residential areas.

Shipping is complete when the receiving facility notifies NASA that the shipment has reached its destination.



Waste Facilities

Three facilities have been identified to accept waste generated from the Reactor Facility.

Alaron, located in Wampum, Pennsylvania is a waste processing facility that

- decontaminates materials where possible for reuse; or
- compacts material (volume reduction) then sends for direct burial disposal.

Envirocare, located in Clive, Utah is a licensed direct burial disposal site that accepts Class A LLRW.

Barnwell Facility in South Carolina is a licensed direct burial disposal site that accepts Class B and Class C LLRW.